ABSTRACT OF THE DISCLOSURE

A technique for controlling a multiplicity of time-sorted queues with a single controller and supporting memory, which may be software-configured so as to allow the use of the controller in an implementation having a multiplicity and variety of output lines or channels. The technique includes receiving a plurality of packets from one or more packet flows at a respective time-based output port queue of the network switch, in which each packet has a timestamp associated therewith. Next, each packet is inserted into a respective timeslot of the output port queue, as indexed by its associated timestamp. The binary value of the timestamp is then partitioned into a plurality of sub-fields, each sub-field comprising one or more bits and corresponding to a predetermined level of acceleration bit-strings. Next, the values at respective locations in at least one memory configured to store a plurality of levels of acceleration bit-strings are asserted, as indexed by the respective sub-fields of bits. Priority encoding is then successively performed for each level of acceleration bit-strings to determine the respective timeslot of the time-based queue containing the packet with the lowest-valued timestamp. Next, the packet is extracted from the output port queue and transmitted over the network. Each output card memory can be divided into a plurality of queues, in which the number of queues corresponds to the number of flows received by the switch and the size of each queue is proportional to the fractional amount of the total bandwidth of the switch used by the corresponding packet flow.

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